DOCUMENT RESUME

ED 246 074 TM 840 345

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TITLE Assessing Progress in the Status of Women Faculty.
PUB DATE Apr 84
NOTE 22p.; Paper presented at the Annual Meeting of the American Educational Research Association (68th, New Orleans, LA, April 23-27, 1984).
PUB TYPE Speeches/Conference Papers (150) -- Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Affirmative Action; College Faculty; Comparative Analysis; Females; Higher Education; *Organizational Change; *Promotion (Occupational); *Research Methodology; Universities; *Women Faculty
IDENTIFIERS *Change Analysis; *Higher Education General Information Survey

ABSTRACT

This paper reports on the development of a "change index" and its application in evaluating the relative performance of individual doctorate-granting universities in hiring and promoting women faculty. Employee data collected in the annual Higher Education General Information Survey (HEGIS) by the National Center for Educational Statistics was used to develop the index. The final model comprised five variables reflecting percentage change over the base year for the number and the proportion of women faculty, the year for the number and the proportion of faculty, the number of women tenured, the number at full professor rank, and the ratio of male to famale faculty. The index is a relative measure of change experienced by an institution; it facilitates comparisons among institutions. A wide range of institutional performance in hiring and promoting women faculty was revealed by applying the index to HEGIS data for doctorate-granting universities. The index served, also, as a dependent variable to assess the relationship between specific institutional characteristics and the degree of change experienced by various institutions. The change index provides a more complex measure of the changing status of women faculty than simple changes in the proportion of women and it provides a basis for comparing the relative success in hiring and promoting women faculty for comparable institutions. (Author/DWH)

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Assessing Progress in the Status of Women Faculty

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Paper prepared for presentation at the annual meeting of the American Educational Research Association, New Orleans, April 23-27, 1984.

TM 840 355

ABSTRACT

Assessing Progress in the Status of Women Faculty

The paper reports on the development of a "change index" and its application in evaluating the relative performance of individual doctorate-granting universities in hiring and promoting women faculty. The final model included five variables reflecting percentage change over the base year for the number and proportion of women faculty, the number of women tenured, the number of women at the full professor rank, and the ratio of male to female faculty. The index is a relative measure of change experienced by an institution and thus facilitates comparisons among institutions. A wide range of institutional performance in hiring and promoting women faculty was revealed by applying the index to HEGIS data for doctorate-granting universities for the period 1971 to 1980. The index was also used as a dependent variable to test the relationship between certain institutional characteristics and the degree of change experienced by various institutions.

Assessing Progress in the Status of Women Faculty

Overview and Objective:

Much of the affirmative action literature focuses on assessments of the status of women faculty across large sectors of higher education, or alternatively, on conditions at a single institution. Thus, we know the percentage of women faculty at the nation's universities, a grouping that includes several hundred institutions, but comprehensive information on individual universities within that broad grouping is not readily accessible. Evaluating progress over time in hiring and promoting women faculty is a further concern. Uniform measures have not been adopted, making interinstitutional comparisons all the more difficult.

This paper reports on the development and application of a "change index" that combines scores in five areas related to faculty women's employment. The index provides a relative measure of the degree of change experienced by an institution during the previous decade and thus facilitates comparisons among institutions. A wide range of institutional performance in hiring and promoting women faculty was revealed by applying the measure to the population of doctorate-granting universities.

Data Base and Method:

The change index was developed using employee data collected in the annual Higher Education General Information Survey (HEGIS) by the National Center for Education Statistics. The HEGIS survey is one of the few comprehensive data sources with identification of individual institutions. Except for a one-year gap in 1973, data are available on the number of men and women faculty by rank over the ten-year period 1971-1980. Tenure data are available from 1974. Data for the 183 universities classified as "doctorate-granting" by the Carnegie Council were selected for testing the model.

Since much of the focus for affirmative action is on recruitment and hiring processes, it would be helpful to have data on newly hired faculty and to compare these results with goals set by the institution. However, hiring data are not readily accessible. What data are collected by the Equal Employment Opportunity Commission are not publicly available. Thus, most studies have necessarily used the change in faculty composition as a bottomline measure of affirmative action effectiveness. While this measure is clearly useful and appropriate, particularly for monitoring the status of women in higher education in general or at certain kinds of institutions, it does not give a very complete picture of women's employment status. The development of a change index incorporating several other variables, in addition to changes in faculty composition, is described in the following section.

Developing the Change Index:

Selecting variables. The process of developing a change index which would permit comparisons of progress among relatively similar institutions was complex and iterative. The first step was to examine the adequacy of a single variable--change in the proportion of women faculty--as a measure of institutional progress. Its virtue, of course, was simplicity and that it followed a pattern reiterated in numerous studies on the general status of women (Levine, 1979; National Center for Education Statistics, 1978-81; Waldenberg, 1981).

In order to test this single-variable model, the change in the proportion of women faculty was calculated for each institution by subtracting the base year percentage of women at all ranks from the 1980 percentage.

Variable One: Percent change in the proportion of women

1980 Proportion - Base year proportion

However, applying this simple method of measuring change to individual institutional records revealed some interesting problems. Particularly troubling were the cases where the number of women employed was actually less than earlier in the decade but the percentage had increased. This was a result of decreasing faculty size. In these cases, women had managed to retain the same or a similar percentage representation while both men and women lost jobs. Other campuses had similar numerical results--little or negative change in percentage--after adding a significant number of women to the faculty. They had hired women, but hired more men in the process of expanding their faculty.

Can one speak meaningfully about "progress" for women in a situation where there are fewer women employed than before? If we are after some estimate of increased opportunity then numbers of jobs as well as percentage of jobs is a legitimate concern.

Two more variables were added to the index at this point: change in the ratio of male to female faculty and change in the number of women faculty. Initially, both were applied as simple subtractions--the base year figure subtracted from the 1980 figure. This had some intuitive appeal in that 80 more positions on one campus clearly represents more employment opportunities for women than 5 more positions on another campus. However, the method did not take into account the vast differences in institutional size and had to be modified accordingly. The final form of these variables represents a percentage increase or decrease from the base year. The ratio variable is a variation on the percentage of women faculty.

Variable Two: Percent change in the ratio of male to female faculty
(Base year ratio-1980 ratio)/Base year ratio

Variable Three: Percent change in the number of women on the faculty (all ranks)
(1980 number-Base year number)/Base year number

None of the variables thus far proposed addresses the issue of distribution by rank or tenure, two critical dimensions of faculty status. Since the mid-1970s there has been increasing recognition that equity for women faculty will not be achieved solely by increasing the percentage of female hires. While access to faculty positions appears to have improved, at least judging by the increased percentage of women at the assistant professor rank, upward mobility continues to be a serious concern. The final two variables for the model reflect changes in the senior ranks.

Variable Four: Percent change in the number of female full professors
(1980 number-Base year number)/Base year number

Variable Five: Percent change in the number of tenured women
(1980 number-1974 number)/Base year number

Note that the tenure variable uses 1974 as a base year since this was the first year tenure data were collected. A parallel version of these two variables was calculated using changes in the <u>percentage</u> of female full professors and tenured faculty rather than changes in <u>numbers</u>. The current version was easier to understand, emphasized increased opportunity as discussed above, and had a greater range of variability since percentage increases in these two areas have been very small.

Other variables were considered, either in addition to the five above or as replacements. For example, a change in the gap between male and female salaries was viewed as an important aspect of equity, but this was particularly difficult to assess for individual institutions. When salary averages were calculated by rank, many universities had empty cells at the upper ranks because there were insufficient numbers of women. There were usually a sufficient number of assistant professors on nine-month contracts to calculate salary averages by sex, but without controlling for discipline, comparisons such as these are dismissed by skeptics as a function of distribution of men

and women by field. On this issue, the carefully matched sample of men and women Ph.D.s examined in a recent study by the National Research Council (Ahern and Scott, 1981) provides more detailed evidence than can be generated using the HEGIS salary data.

Comparing progress at individual institutions. One hundred fifty-nine of the 183 doctorate-granting institutions had sufficient longitudinal information to calculate scores on these five areas.

The mean, minimum and maximum values for the five separate variables are as follows:

Change in:	(Variable Abbreviation)	Mean	Minimum	Maximum
Proportion women on faculty	(C_PRO_F)	.04	- .05	.16
Ratio male:female faculty	(C_RATIO)	.26	- .29	.80
Number of women faculty	(INCWJOBS)	.52	-1.00	3.44
Number of female full professors	(C_FFULL)	1.10	-1.00	21.00
Number of tenured women	(CTENWOM)	.53	-1.00	5.00

A composite change index was created by converting the "scores" on each variable to standard scores (mean=0, standard deviation=1). The purpose of this step was to transform the score so that it could be easily recognized as representing a value greater or less than the average score and so that the five variables, similarly transformed, could be summed to make a composite change index. The values of the change index ranged from a maximum of 13.77 to a minimum of -15.31.

An example of how this worked for the institution with the highest change index follows:

	C_PRO_F	C_RATIO	INCWJOBS	C_FFULL	CTENWOM	Change Index
Raw Score	.16	.80	3.44	4.00	2.00	___
Standard Score	3.57	2.08	4.94	1.31	1.87	13.77

The composite change index is a comparative rather than absolute measure of institutional change. Institutions experiencing larger than average percentage increases on several variables would tend to have high positive values for the composite change index. The range of raw scores as well as values for the composite measure is wide, indicating substantial variation among institutions. Although the above example illustrates a case where all the separate values were positive, this is not true for many institutions. Progress in one area did not necessarily assure equivalent progress in other areas. It is also clear that women have lost ground over the decade at some universities. Actual change score values for the top and bottom 20 institutions are included in the appendix.

The variation in scores raised questions about what patterns were observable in the data. What types of institutions have changed the most? The following section uses the change index as a dependent variable in testing the relationship between certain institutional characteristics and the degree of change experienced by the institution.

Institutional Change Over the Decade:

Institutional characteristics drawn from additional HEGIS data files included the proportion of women students, Carnegie classification, land-grant status, public or private control, annual enrollment figures, location by city size and region of the country and curriculum emphasis. These variables were tested along with other aspects of faculty composition to see if any significant trends could be identified. Variable names and definitions and an intercorrelation matrix are included in the appendix.

Of the 159 doctorate-granting universities, many, though not all, with a very low percentage of women early in the decade appear to have made substantial efforts to recruit junior women faculty. One indication of

this is higher change scores for institutions with lower percentages in the base year. Table 1 lists the 20 institutions with the highest composite change index scores, along with their base year percentage and 1980-81 percentage of women on the faculty.

Fifteen of the top 20 institutions had less than 10% women on their faculties early in the decade. A move toward a coeducational student body was apparently influential in promoting change on the faculty for a number of universities. At least 9 of the 20 were predominantly male institutions which recently shifted to coeducation or dropped restrictive admissions policies for women (Dartmouth, MIT, Notre Dame, Lehigh, Brown, Princeton, Harvard, NCSU, and VPI&SU).

Another indication of stepped-up hiring efforts at some institutions is a very small percentage of women at the full professor rank and a much increased percentage at the assistant professor rank. North Carolina State University is an example. Only 2.4% of full professors in 1980-81 were women, a legacy of days when most of the student body and faculty were men. Now, 26.5% of the assistant professors are women--a sizeable increase over the 9% figure for that rank in 1972-73. Many of these 'much changed' institutions still have a low percentage of women on their faculty.

Given the relationship between the starting point for an institution and its change score, an exploration of the influence of other institutional characteristics was conducted using a stepwise regression with the base year percentage of women (starting point) as a covariate. In this way, the unique contribution of other continuous variables could be assessed after the influence of starting point was partialled out. Only two other variables were found to contribute independently to the variance of the change score: change in faculty size and curriculum emphasis. The R-squares and associated F's for each step are shown in the appendix.

TABLE 1

Percent Women on Faculty at 20 Institutions with Highest Change Scores

Institutions by Rank Order on Composite Change Index	Base Yr % Women	1980-81 % Women	Change in %
Dartmouth College	4.8	20.3	+15.5
N Carolina State Univ	7.1	17.5	+10.4
Mass Institute of Tech	3.0	9.8	+ 6.8
Univ of Notre Dame	2.6	7.5	+ 4.9
U of South Carolina,Columbia	10.9	20.3	+ 9.4
U of South Florida	16.0	16.8	+ .8
Rice University	5.6	13.7	+ 8.1
Virginia Polytechnic Inst & State University	6.5	14.0	+ 7.5
Rensselaer Polytechnic Inst	1.6	4.4	+ 2.7
Lehigh University	3.9	7.7	+ 3.8
Brown University	6.6	13.5	+ 6.9
Princeton University	5.2	11.6	+ 6.4
Univ of Florida	7.0	15.2	+ 8.2
Univ of Kentucky	9.5	16.5	+ 7.0
Vanderbilt University	13.0	22.3	+ 9.3
Northeastern University	21.3	25.6	+ 4.3
Harvard University	4.0	10.7	+ 6.7
St. Louis University	23.2	33.9	+10.7
Stanford University	5.5	11.6	+ 6.1
Clark University	9.3	17.7	+ 8.4

Source: Employee Surveys, 1971, 1972, 1980, HEGIS, National Center for Education Statistics

Of the two measures representing institutional growth, only change in faculty size entered the equation. An increase in faculty size was associated with greater change scores. The size of the faculty for a given student enrollment varies enormously for these institutions and this variability probably attenuated the relationship between enrollment growth and the change index. Also, scientifically-oriented universities were somewhat less likely to have higher change scores.

Several variables, in addition to enrollment growth failed to add significantly to the model. The proportion of women students and Carnegie classification were both associated with the current proportion of women on the faculty, but were not significantly related to the change index. Neither size of the city or current enrollment met the $p < .05$ level for entry into the equation. Thus larger schools have not made greater gains than smaller schools, nor have those institutions in large metropolitan areas made more progress than those in rural areas.

Some differences were noted among regions of the country. Institutions located in the New England area had the highest average change index and those in the Far West had the lowest. The move toward coeducation by some previously all-male Ivy League institutions resulted in an increase in opportunities for women faculty in New England universities where these schools are concentrated. But this shift took place in an environment of low growth: average faculty growth for the region was 4.8%, well below the growth rate for all institutions (8%). The 15 schools in the New England region reported a net gain of 570 jobs for women and a net loss of 154 jobs for men over the decade. All but one institution in the New England region reported an increase in the absolute number of women faculty.

This preliminary exploration provides some clues concerning institutional change. Universities whose early records indicated only a token presence of women have made measurable efforts to increase the number and status of women on their faculties. Institutions reporting an increase in the size of their faculty over the decade tended to show more change; expansion apparently provided opportunities to add women. A scientific and technical curriculum orientation was predictive of less change. Size of the city in which the university is located was not a relevant characteristic, although institutions in the New England region appear to have experienced more change than those in other regions.

Caveats Concerning the Change Index:

The change index is constructed from outcome measures (e.g. What has been the percentage change in the number of women faculty? the number of tenured women?). There was no assumption that a high change score was necessarily a result of vigorous affirmative action efforts since a similar outcome could be achieved by adding a nursing school, for instance, and leaving other areas unchanged. Outcome measures also ignore institutional constraints. Careful reflection produced no satisfactory means to weigh the relative efforts made by institutions with quite different faculty mixes. Discipline specification, turnover data, and a more limited study would be necessary to examine this issue in greater detail. This researcher is unaware of an existing national data base that allows such questions to be asked from an institutional perspective.

Interpretation of the change index itself requires some caution. Given the method of calculating the index, the addition of even a few women to a small faculty with a very low starting point could result in a high change score. Whether or not the change measured in a case like this is more

artifactual than real is a matter of judgment. In most cases, evaluation of the institution's reports for the ten-year period supports the positive outcome reached through the change index method. The one case where the outcome was clearly an artifact of exceptionally small faculty size (less than 50 faculty members) was eliminated. In all cases, the index reflects the degree of change, not a state of equity for women faculty. The calculations generally favor those schools which began with a low percentage of women faculty and experienced substantial change.

Conclusion:

The change index described in this paper is a tentative proposal for measuring progress for women faculty. It serves two useful purposes: it provides a more complex measure of the changing status of women faculty than simple changes in the proportion of women and it provides a basis for comparing the relative success in hiring and promoting women faculty for institutions within the same broad classification. Systematically identifying institutions whose performance indicates above average gains is a first step in exploring how more successful institutions have created positive change in the status of women faculty and sharing this information with the wider higher education community.

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Appendix A

Raw Scores
(Standardized Scores)

CHANGE INDEX VALUES FOR TOP 20 INSTITUTIONS

UNIVERSITY	C_PRO_F	INCWJOBS	C_FFULL	CRATIO	CTENWOM	COMPOSITE CHANGE INDEX
Dartmouth College	.16	3.44	4.00	.80	2.00	
	(3.57)	(4.94)	(1.31)	(2.08)	(1.87)	13.77
No. Carolina St Univ	.10	2.12	6.00	.64	1.92	
	(1.96)	(2.70)	(2.21)	(1.46)	(1.76)	10.10
Mass Inst of Tech	.07	2.73	3.50	.72	2.50	
	(0.86)	(3.74)	(1.08)	(1.76)	(2.51)	9.95
Univ of Notre Dame	.05	1.50	1.00	.68	5.00	
	(0.28)	(1.65)	(-0.05)	(1.60)	(5.68)	9.17
U of SC, Columbia	.09	2.11	2.33	.52	3.00	
	(1.68)	(2.69)	(0.56)	(1.03)	(3.14)	9.10
U of So Florida	.01	.11	21.00	.06	1.06	
	(-1.01)	(-0.70)	(8.78)	(-0.71)	(0.68)	7.24
Rice University	.08	1.61	2.33	.63	2.00	
	(1.25)	(1.84)	(0.56)	(1.42)	(1.87)	6.93
Va Poly Inst & St U	.07	2.32	0.71	.57	1.67	
	(1.06)	(3.05)	(-0.18)	(1.22)	(1.45)	6.60
Rensselaer Poly In	.03	2.00	2.00	.64	2.00	
	(-0.41)	(2.50)	(0.40)	(1.45)	(1.87)	5.82
Lehigh Univ	.04	1.27	1.00	.51	3.33	
	(-0.10)	(1.27)	(-0.05)	(0.97)	(3.56)	5.65
Brown Univ	.07	1.07	0.33	.55	2.88	
	(0.90)	(0.92)	(-0.35)	(1.14)	(2.98)	5.59
Princeton U	.06	1.28	2.50	.58	1.83	
	(0.73)	(1.28)	(0.63)	(1.25)	(1.66)	5.56
University of FL	.08	2.00	1.23	0.58	0.50	
	(1.27)	(2.50)	(0.06)	(1.24)	(-0.03)	5.04
University of KY	.07	1.30	3.75	.47	.87	
	(0.89)	(1.31)	(1.19)	(0.82)	(0.44)	4.65
Vanderbilt Univ	.09	1.15	.80	.48	1.45	
	(1.62)	(1.07)	(-0.14)	(0.87)	(1.18)	4.60
Northeastern U	.04	1.61	6.00	.21	.73	
	(0.08)	(1.84)	(2.21)	(-0.12)	(0.26)	4.26
Harvard Univ	.07	1.45	2.14	.65	.38	
	(0.83)	(1.57)	(0.47)	(1.52)	(-0.19)	4.19
St. Louis Univ	.11	.23	.38	.41	2.24	
	(2.08)	(-.51)	(-0.32)	(0.62)	(2.17)	4.0
Stanford Univ	.06	1.39	3.33	.55	.21	
	(0.63)	(1.47)	(1.01)	(1.15)	(-0.40)	3.85
Clark Univ	.08	1.08	1.33	.52	.57	
	(1.36)	(0.95)	(0.10)	(1.04)	(0.06)	3.50

Appendix A (cont.)

Raw scores
(Standardized Scores)

CHANGE INDEX VALUES FOR BOTTOM 20 INSTITUTIONS

UNIVERSITY	C_PRO_F	INCWJOBS	C_FFULL	CRATIO	CTENWOM	COMPOSITE CHANGE INDEX
Cal Inst of Tech	-0.01	-1.00	-1.00	-1.95	-1.00	
	(-1.63)	(-2.59)	(-0.95)	(-8.20)	(-1.94)	-15.31
SUNY at Albany	-0.03	-0.28	-0.42	-0.28	-0.18	
	(-2.28)	(-1.37)	(-0.69)	(-1.95)	(-0.90)	-7.19
Hofstra Univ	-0.05	-0.27	1.00	-0.29	-0.18	
	(-2.81)	(-1.35)	(-0.05)	(-1.98)	(-0.90)	-7.08
Boston Univ	-0.03	-0.29	0.10	-0.22	-0.07	
	(-2.26)	(-1.38)	(-0.45)	(-1.74)	(-0.73)	-6.58
U of Hawaii	-0.03	-0.17	0.00	-0.17	-0.13	
	(-2.12)	(-1.18)	(-0.50)	(-1.56)	(-0.83)	-6.18
Univ of Houston	-0.02	-0.05	-0.12	-0.21	-0.10	
	(-1.98)	(-0.97)	(-0.55)	(-1.68)	(-0.79)	-5.98
U of Ill Chicago	-0.03	-0.21	0.53	-0.20	0.09	
	(-2.24)	(-1.25)	(-0.26)	(-1.67)	(-0.55)	-5.97
Texas Tech Univ	-0.02	-0.03	-0.36	-0.11	-0.13	
	(-1.76)	(-0.94)	(-0.66)	(-1.34)	(-0.83)	-5.53
U of Minn Mnpls	0.00	-0.26	-0.30	-0.03	-0.27	
	(-1.39)	(-1.33)	(-0.64)	(-1.02)	(-1.02)	-5.39
Ohio State Univ	0.00	-0.19	-0.02	-0.03	-0.07	
	(-1.40)	(-1.20)	(-0.51)	(-1.04)	(-0.76)	-4.92
Claremont Grad Sch	0.00	0.00	0.00	-0.11	0.00	
	(-1.32)	(-0.89)	(-0.50)	(-1.34)	(-0.67)	-4.72
Rockefeller U	0.00	0.06	-1.00	0.00	0.00	
	(-1.26)	(-0.78)	(-0.95)	(-0.91)	(-0.67)	-4.57
Baylor Univ	-0.01	0.39	-0.47	-0.05	0.24	
	(-1.58)	(-0.23)	(-0.71)	(-1.11)	(-0.36)	-3.98
Sthn Ill U Carb	0.00	0.17	0.06	0.01	-0.02	
	(-1.22)	(-0.61)	(-0.47)	(-0.88)	(-0.70)	-3.88
U N C Greensboro	-0.00	0.28	0.08	-0.02	0.18	
	(-1.39)	(-0.41)	(-0.46)	(-0.99)	(-0.44)	-3.69
Case Western Res	-0.02	-0.04	0.23	0.10	-0.28	
	(-0.70)	(-0.96)	(-0.39)	(-0.53)	(-1.05)	-3.63
North Texas St U	0.01	0.18	0.07	0.04	-0.02	
	(-1.06)	(-0.59)	(-0.47)	(-0.76)	(-0.69)	-3.57
Duke University	0.04	-0.53	-0.75	0.29	-0.26	
	(0.01)	(-1.79)	(-0.84)	(0.14)	(-0.99)	-3.46
U of Missouri-Col	0.00	-0.02	0.53	-0.01	0.49	
	(-1.29)	(-0.92)	(-0.26)	(-0.94)	(-0.05)	-3.45
U of Ill Urbana	0.01	0.04	0.08	0.07	0.27	
	(-1.04)	(-0.81)	(-0.46)	(-0.65)	(-0.33)	-3.30

Appendix B

VARIABLE DEFINITIONS

Abbreviated Variable Name	Variable Name	Variable Definition & Coding Information
pro_f	Proportion women, 1980	Proportion of total 1980 faculty which is female; includes all ranks
stpt	Starting point	Proportion of total faculty in the base year (1971 or 1972) which is female; includes all ranks
cfacsize	Change in faculty size	(1980 faculty total - Base year faculty total)/Base year faculty total
tot	Total faculty 1980	Total number F-T instructional faculty, 1980-81.
scitech	Proportion scientific/ technical degrees awarded	(Sum of degrees awarded at all levels in agriculture, engineering, biological & physical sciences, computer science, & math in 1980)/Total degrees awarded, 1980
enroll	Student enrollment, 1980	Student enrollment, Fall 1980
egrowth	Enrollment growth	(1980 enrollment - Base year enrollment)/ Base year enrollment
profstu	Proportion women students	Proportion of women students, 1979
control	Control	Combination pub/priv (0); public (1); private (2)
carnegie	Carnegie classification	Four subclassifications of Doctorate-Granting Universities: Research I (1); Research II (2); Doctorate-Granting I (3); Doctorate-Granting II (4)
obereg	Region of the country	Regions as determined by Dept of Commerce: (1) New Eng: CT ME MA NH RI VT (2) Mid East: DE DC MD NJ NY PA (3) Great Lakes: IL IN MI OH WI (4) Plains: IA KS MN MO NE ND SD (5) Southeast: AL AR FL GA KY LA MS NC SC TN VA WV

Abbreviated Variable Name	Variable Name	Variable Definition & Coding Information
obereg (cont)		(6) Southwest: AZ NM OK TX (7) Rocky Mountains: CO ID MT UT WY (8) Far West: AK CA HI NV OR WA (9) Outlying areas: AO CZ GU PR TO VI (0) US Service Schools
citysize	Size of SMSA in which univ is located	(0) Not identified (1) outside any SMSA (2) anywhere w/in an SMSA of less than 250,000 (3) anywhere w/in an SMSA of 250,000-499,999 (4) anywhere w/in an SMSA of 500,000-999,999 (5) in SMSA of 1,000,000-1,999,999 outside center city (6) in SMSA of 1,000,000-1,999,999 inside center city (7) in SMSA or SCSA of 2,000,000 or more outside center city (8) in SMSA or SCSA of 2,000,000 or more w/in center city
landgr	Landgrant status	Non-landgrant (0)/Landgrant (1)/Member NASULGC (2)
c_pro_f	Change in proportion of women faculty	1980 proportion - Base year proportion
cratio	Change in ratio male:female	(Base year ratio - 1980 ratio)/Base year ratio
inwjobs	Change in number of women	(1980 number - Base year number)/Base year number
c_ffull	Change in no. of female full professors	(1980 number - Base year number)/Base year number
ctenwom	Change in no. tenured women	(1980 number - 1974 number)/1974 number
cindex	Composite change index	(Sum of standardized variables: c_pro_f, cratio, inwjobs, c_ffull, & ctenwom)

Appendix C

INTERCORRELATION MATRIX

	CINDEX	PRO_F	STPT	PROFSTU	CFACSIZE	SCITECH	EGROWTH	ENROLL	CONTROL	CITYSIZE	OBEREG	CARNEGIE	LANDGR	TOT
CINDEX	1.00													
PRO_F	-0.01	1.00												
STPT	-0.34	0.91	1.00											
PROFSTU	-0.15	0.79	0.78	1.00										
CFACSIZE	0.30	0.24	0.19	0.15	1.00									
SCITECH	0.04	-0.58	-0.53	-0.76	-0.06	1.00								
EGROWTH	0.19	0.08	0.03	0.02	0.39	0.11	1.00							
ENROLL	-0.08	0.01	0.04	0.19	0.08	-0.17	0.03	1.00						
CONTROL	0.16	-0.04	-0.13	-0.33	-0.14	0.07	-0.05	-0.44	1.00					
CITYSIZE	-0.01	0.12	0.09	-0.10	-0.08	-0.03	-0.02	-0.02	0.60	1.00				
OBEREG	-0.16	-0.06	0.01	0.03	0.14	-0.05	0.09	-0.03	-0.28	-0.22	1.00			
CARNEGIE	-0.01	0.31	0.36	0.27	0.19	-0.23	0.06	-0.40	-0.09	-0.15	0.02	1.00		
LANDGR	-0.06	-0.15	-0.11	0.06	0.06	0.02	0.02	0.34	-0.68	-0.38	0.18	-0.10	1.00	
TOT	0.00	-0.07	-0.07	0.10	0.07	-0.04	0.00	0.88	-0.44	-0.15	0.00	-0.55	0.31	1.00

Appendix D

RESULTS OF STEPWISE REGRESSION ON CHANGE INDEX

Variable	R^2	R^2 Change	F (R^2 Change)	p (R^2 Change)	B value Final Model
STPT	0.1144				-25.18
CFACSIZE	0.2538	0.1394	29.14	0.0001	6.76
SCITECH	0.2878	0.0340	7.41	0.0072	-4.32